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AUTHOR(S): S. B. NOTT

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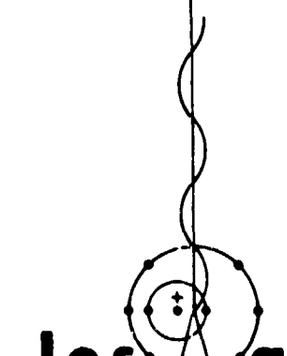

los alamos
scientific laboratory
of the University of California
LOS ALAMOS, NEW MEXICO 87545

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BALANCE SHEETS AND U.S. DAIRY FARMS

Sherrill B. Nott, Ph.D.
Michigan State University
Los Alamos Scientific Laboratory

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INTRODUCTION

The first objective of this paper is to present balance sheet information pertaining to dairy farms as published in several different states and as an incidental benefit make you aware of the several sources from which this information is available. The second objective is to present some of the ways farm management specialists and agricultural economists are currently analyzing dairy farm balance sheets. I have made no attempt to analyze or pass judgment on the data presented; let us do that together during the discussion.

DATA SOURCES

The data sources are discussed in Appendix A. The data came mostly from annual financial accounting projects. There are two exceptions; these are the sources from Arizona and California. In both cases, the data are synthesized budgets and deal with early 1979 levels as opposed to the rest of the paper's information which deals with December 31, 1977 or January 1, 1978. In all sources cited, the author(s) have implied the data are not representative of all dairy farms in their area and are not a random sample. The author(s) state their averages would be representative of better than average management within their geographical area, or words to that effect.

The various asset categories used by the several states were reduced to the five headings presented in Table 1. The data was put on a per cow basis to enhance comparisons across the states. The per cow statistics from Missouri may be influenced by the fact that the average for that state's dairy farm organization did include noticeably more dollars of non-dairy livestock inventories and cash income indicating that Missouri dairy farms as reported were not as specialized in dairy production as were the other states in Table 1. A perusal of the data sources indicate that in all the states in Table 1 that the roughage is produced on the farm; in some states a portion of the grain fed is also farm grown.

Some states present more detailed information than do others. The myriad of details to be found are shown in Table 2. One often hears the statement that extension workers cannot get the kind of financial information shown in Table 2. We are fortunate the authors in Washington, Wisconsin and New York were not aware of this problem.

Asset listings and per cow investments derived there from are given in Table 3. These resulted from synthesized budget estimates. Note how the per cow total assets compare with those in Table 1.

FARM BALANCE SHEET ANALYSIS

A common method of analyzing assets and liabilities is to give the percentage distribution of the total assets by asset category. These were computed and are in Table 4. After looking at Table 4 one might question what the impact on these percentage distributions would be with various herd sizes. Fortunately, Pennsylvania has made these computations; see Table 5 which was taken directly from that state's publication.

Probably the most common ratio computed in balance sheet analysis is the percentage that net worth is of total assets. This, along with a breakdown of the amount of liabilities in long term or less than long term classifications are given in Table 6. Both Pennsylvania and New York have computed this equity percentage by size of farm (see Tables 5 and 7). New York computes a series of financial measures for each size of farm as given in Table 7. A rule of thumb which has been in existence for some time is that a well managed dairy farm should not allow total debt payments to exceed 25-30% of gross milk income. The last column in Table 7 shows this statistic for various sizes of New York dairy farms.

The financial community often uses ratio analysis in looking at balance sheets and income statements. Washington computes several financial ratios in their report which are reproduced in Table 8. The first four ratios come directly from the balance sheet, but the other three are a combination of balance sheet and income statement values.

DISCUSSION IDEAS

Given this information, there is much we could discuss. We could heap praises upon the writers all across this country who contributed the raw data, the final printed reports and formats similar enough to make comparisons possible. We could discuss the dangers of trying to compare dairy farm balance sheets in various states because formats,

procedures and operating biases are quite different. We could discuss the standard accounting format for a balance sheet that says cash should be listed first under assets and then list things from top to bottom as they are most like cash or take the longest to convert to cash. We could discuss the format that says short term debts should be listed first and long term debts should be listed last in the liabilities section. We could then discuss the almost total lack of adherence to these formats exhibited by most of the writers of the cited data sources. We could discuss the costs and benefits to be derived from a common balance sheet reporting format to be used by all farm accounting systems across the country. We could discuss which financial measures and/or ratios would be best to calculate and present to our readers. To close on a positive note, we could discuss the remarkable similarities shown across the country in Tables 1 and 3 and the similarities shown in Tables 5 and 7 among different sizes of dairy farms.

APPENDIX A

Data Sources and Bibliography

ARIZONA — 1979 Arizona Drylot Dairy Budgets by Roger Selley, Lewis Daugherty, Otis Lough, Dennis Armstrong and Timothy Logan, unnumbered publicaton of the Cooperative Extension Service and the Dept of Agr. Econ., The University of Arizona, Tucson, AZ 85721, May, 1979, 54 pp. Synthesized budget estimates for 350 and 750 cows, including investments and annual operating income plus expenses are given.

CALIFORNIA — Personal correspondence with A. D. Reed, Dept. of Agr. Econ., University of California, Davis, CA 95616. Data taken from a dairy enterprise budget for 300 cows in the South Bay production area, 1979 data updated on 3/6/79, 3 pp.

MICHIGAN — Unpublished data analyzed for this paper from 300 farms which are a subset of those described in Business Analysis Summary for Specialized Michigan Dairy Farms, 1977, by L. H. Brown and S. B. Nott, Agr. Econ. Report No. 343, Agr. Eon. Dept., Agr. Hall, Michigan State University, East Lansing, MI 48824, September, 1978, 29 pp. The data are averages of farmers participating in Telfarm, a computerized mail-in farm records system.

MINNESOTA — Agrifax Statistics, A Summary of 1977 Data from Agrifax Farm Records, by Jerome E. Bambenek, Production Credit Association, April, 1978, 44 pp. Agrifax is a mail-in computerized financial accounting system sponsored by the Production Credit Associations. The printed report is for farm members in the St. Paul Farm Credit District. The Minnesota data in this paper are the averages of all 138 dairy members.

MISSOURI — Missouri Farm Business Summary, 1977, by Carrol L. Kirtley and James B. Kliebenstein, FM-7890, Dept. of Agr. Econ., University of Missouri, Columbia, MO 65201, October, 1978, 30 pp. The data are averages of 39 farmers with dairy enterprises in the mail-in records system.

NEW YORK — Dairy Farm Management Business Summary, New York, 1977, by C. A. Bratton, A. E. Res. 78-8, Dept. of Agr. Econ., Cornell University, Ithaca, NY 14853, July, 1978, 51 pp. Total data base is 570 farms averaging 71 cows; data from 73 farms with 70 to 84 cows are used. The 570 farms were part of an ongoing extension farm management project.

Appendix A Continued

NORTH DAKOTA Same source as Minnesota. The averages of all 28 dairy members were used in this paper.

OHIO 1977 Farm Business Analysis Report, Dairy Summary, by Richard D. Duvick, Timothy A. Short and Frank M. Gorsuch, ESO No. 487, Dept. of Agr. Econ. and Rural Soc., The Ohio State University, 2120 Fyffe Road, Columbus, OH 43210, 16 pp. Ninety-eight dairy farms contributed the data summarized in the university report. The middle 50% averages are used in this paper; this was measured by the return per hour to unpaid labor and management income.

PENNSYLVANIA 1977 Pennsylvania Dairy Farm Business Analysis by Samuel A. Dum, Farm Management 58, Cooperative Extension Service The Pennsylvania State University, University Park, PA September, 1978, 24 pp. The data came from 1,212 dairy farms whose records were submitted for analysis and summary to the university. These farms averaged 59 cows; the averages for the 50 to 59 cow group were used in this paper.

WASHINGTON 1977 Report of the Vocational Agriculture Farm Management Program for Everett & Skagit Valley Community Colleges, by Willard E. Hansen and Oliver Kienholz, 28+ pp. The 95 farms averages were dairy farms. The year end records are computer processed in Wisconsin and the colleges print the report. This paper uses the averages of all 95 farms.

WISCONSIN(a) Same source as Minnesota. The averages of all 839 dairy members were used in this paper.

WISCONSIN(b) 1977 Wisconsin Farm Business Summary, by R. A. Luening, A2415, Cooperative Extension Service, University of Wisconsin, 1535 Observatory Road, Agr. Bulletin Building, Madison, WI 53706, 1978, 35 pp. The university processed the year end analyses. This paper uses the average of 148 farms that had 50 to 74 cows.

Table 1. INVESTMENT PER COW BY ASSET CATEGORIES

From Accounting Systems, End of 1977

State	Other Farm Assets	Feed, Crops and Supplies	Live-Stock	Machinery and Equipment	Real Estate	Cows per Farm
Washington		$190	$728	$368	$1,10[illegible]	140
Missouri	$ 5	469	1,262	727	4,554	46
Wisconsin (b) (50-74 cows)		562	777	852	1,545	62
Michigan	83	501	838	720	2,465	83
Ohio (middle 50%)		471	759	614	2,617	57
Pennsylvania (50-59 cows)	87	411	765	534	2,295	59
New York (70-84 cows)	200	343	801	807	2,437	75

Table 2. BALANCE SHEET DETAILS FROM 3 SOURCES

Dairy Farms, End of 1977

	Washington	Wisconsin(a)	New York (70-84 cows)
Farm Assets:			
Cash; checking and savings accou ts	$ -	$ 2,816	$ 2,453
Accounts receivable	-	1,457	7,789
Other farm assets	-	8,345	4,758
Feed, crops and supplies	26,572	25,098	25,690
Livestock	101,636	45,794	60,073
Machinery and equipment	51,345	43,112	60,538
Buildings, fences, etc.	36,935	-	-
Farm land	116,815	-	-
Land and buildings	-	143,657	182,777
Other fixed assets	-	3,030	-
Non-Farm Assets:			
Cash and savings accounts	8,856	-	5,748
Cash value life insurance	-	-	3,929
Stocks and bonds	-	-	2,851
Real estate dwelling	18,386	-	4,378
Auto (personal share)	-	-	790
Other items	29,380	3,074	1,023
Total Farm Family Assets:	$389,925	$286,983	$362,797
Liabilities:			
Current and intermediate			
Accounts Payable	$ 7,509	$ 2,342	$ -
Notes and other farm debts	14,525	15,256	7,919
Installment contracts	-	-	3,370
Production credit association	-	48,849	-
Liens, chattel mortgages	49,834	-	40,606
Long term			
Real estate mortgages	78,505	-	68,107
Federal land bank	-	24,395	-
Other notes	-	34,156	662
Total Liabilities:	$150,373	$124,998	$120,664
Farm Family Net Worth:	239,552	161,985	242,133
Liabilities and Net Worth	$389,925	$286,983	$362,797

Table 3. NEEDED INVESTMENTS FOR DAIRIES IN ARIZONA AND CALIFORNIA

Budget Estimates for January 1, 1979

	Investment Total[1]		Investment Per Cow[2]	
	Arizona	California	Arizona	California
Other Farm Assets	$ 336,950[3]		$ 960	-
Feed, Crops and Supplies	?	?	-	-
Livestock	652,000	$244,500	1,860	$ 820
Machinery	69,260	30,319	200	130
Equipment	493,100	154,322	1,410	510
Land[4]	327,600	120,000	940	400
Total Listed Assets	$1,878,910	$558,141	$5,370	$1,860

[1]From: 1979 Arizona Drylot Dairy Budgets by Selley, et.al.; and personal correspondence from Reed. Asset categories conform to California assumptions.

[2]Arizona assummed 350 cows producings 15,250 lbs. of milk each; California assummed 300 cows producing 16,320 lbs. of milk each.

[3]Investment required for daily milk base allowing access to UDA "quota price."

[4]80 acres of land plus excavation in Arizona which allows for expansion to 700 cows; 40 acre farmstead in California. In both states, building shell investments are included in the equipment category.

Table 4. PERCENT DISTRIBUTION OF ASSETS BY STATE

From Accounting Reports or Budgets

State	Other Farm Assets	Feed Crops and Supplies	Live-Stock	Machinery and Equipment	Real Estate
			Percent		
Washington		8	31	15	46
North Dakota	5	8	11	18	58
Missouri		7	18	10	65
Minnesota	4	10	14	19	53
Wisconsin(a)	4	9	16	19	52
Michigan	2	11	18	16	53
Ohio (middle 50%)		10	17	14	59
Pennsylvania (50-59 cows)	2	10	19	13	56
New York (70-84 cows)	4	8	17	18	53
California			44	35	21
Arizona	18		35	30	17

Table 5. CAPITAL ANALYSIS, 1,212 PENNSYLVANIA DAIRY FARMS, 1977.

Item		Average of Farms with Cow Numbers							
		20-29	30-39	40-49	50-59	60-69	70-89	90-109	110 and More
Net worth	%	80	74	71	71	68	68	64	64
Capital turnover	yrs	3.77	3.42	3.22	3.21	3.08	2.91	3.01	2.77
Rate return on investment	%	-2.91	2.07	2.96	3.43	4.98	5.14	6.57	6.50
Percent assets in:									
Land and bldgs.	%	58	54	53	54	53	50	52	50
Machinery	%	12	14	13	14	14	14	13	13
Livestock	%	18	19	21	20	20	22	21	22
Inventories	%	9	10	10	10	10	11	11	12
Cash and accts. rec.	%	3	3	3	2	3	3	3	3
Total assets per dairy cow	$	5,257	4,832	4,578	4,475	4,402	4,130	4,275	4,010
Percent cash income to pay DIRTI 5*	%	29	29	29	30	30	29	29	30

*Depreciation, interest, repairs, taxes, and insurance.

Source: Table 18 in "1977 Pennsylvania Dairy Farm Business Analysis," by Samuel A. Dum.

Table 6. PERCENT DISTRIBUTIONS OF DEBTS AND NET WORTH

Farm Accounting Systems, End of 1977

State	Liabilities		Net Worth
	Short and Intermediate Term	Long Term	
Washington	22	23	55
North Dakota	21	23	56
Minnesota	26	18	56
Wisconsin (a)	23	21	56
Michigan	14	19	68
Pennsylvania (50-59 cows)	10	19	71
New York (70-84 cows)	15	20	65

Table 7. FINANCIAL MEASURES BY DAIRY FARM SIZE

New York Accounts, January 1, 1978

Number of Cows	Percent Equity	Farm Debt Per Cow	Available For Debt Service and Living	Scheduled Annual Debt Payment	Scheduled Debt Payment Per Cow	Scheduled Debt Payment as a % milk check
	%	$	$	$	$	%
Less than 40	70	1,414	13,192	7,567	236	20
40 to 54	63	1,660	19,910	11,965	260	21
55 to 69	65	1,535	27,670	15,729	258	20
70 to 84	67	1,600	36,034	21,015	280	20
85 to 99	65	1,440	36,260	22,550	245	19
100 to 114	56	1,730	39,590	32,980	314	23
115 to 129	65	1,410	53,640	26,390	220	16
130 to 149	69	1,290	58,000	29,330	210	15
150 or more	66	1,370	78,600	46,850	240	17

Source: Table 48 in "Dairy Farm Management Business Summary, New York, 1977" by C. A. Bratton.

Table 8 FINANCIAL RATIOS ON WASHINGTON FARMS

December 31, 1977

Description	Ratio
Total assets to total liabilities	2.593
Non-real estate assets to non-real real estate liability	3.030
Real estate assets to real estate liabilities	2.193
Net worth to total liabilities	1.593
Cash operating expenses to adjusted total farm sales	.836
Total farm receipts to average farm capital	.554
Total farm receipts to average farm capital	.824